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Estimates of boundary layer parameters using measured wind and temperature profile near the ground

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In almost every application related to planetary boundary layer, PBL, two parameters are of the most relevance, ”friction” velocity and PBL height. The first is connected to near surface processes, while the second one appears in the problems related to the whole BL or its substantial portions.
One of the most famous parametrizations of the of the PBL height is $h \sim \frac{u_{*o}}{f}$. This paper looks into this formulation for different stability classes and mean daily variation of wind and these parameters, using the approach made by Holstlag (1984), to estimate diabatic wind profile where z_o is independent of stability, but depends on wind direction. The second procedure used here is the one suggested by Kramm (1989), where z_o is a function of stability and u_{*o} depends on z_o and L, the Monin-Obukhov length scale, and all of them, u_{*o},z_o and L, are simultaneously calculated through the least square method.
From these parameters two methods for wind extrapolations with height are analyzed, Beljaars and Holstlag (1990), and Grining amd Batchvarova (2007). The wind data came form the Caubauw wind mast 1987, while the second set is wind and temperature gradient from the Panonian region, synoptic weather station 13168 near the city of Novi Sad, Serbia.
Finally we analyze the difference between extrapolated and measured wind speed at Caubauw mast for different values of friction velocity, roughness length and Obukhov length.